

MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for September, 1900, is based on reports from about 3,097 stations furnished by employees and voluntary observers, classified as follows: regular stations of the Weather Bureau, 158; West Indian service stations, 12; special river stations, 132; special rainfall stations, 48; voluntary observers of the Weather Bureau, 2,562; Army post hospital reports, 18; United States Life-Saving Service, 9; Southern Pacific Railway Company, 96; Canadian Meteorological Service, 32; Mexican Telegraph Service, 20; Mexican voluntary stations, 7; Mexican Telegraph Company, 3. International simultaneous observations are received from a few stations and used, together with trustworthy newspaper extracts and special reports.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Meteorologist to the Hawaiian Government Survey, Honolulu; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Mr. Maxwell Hall, Government Meteorologist, Kingston, Jamaica; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service;

and Commander Chapman C. Todd, Hydrographer, United States Navy.

The REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe. The current number has been put through the press by Prof. Alfred J. Henry, the Editor being absent from the city.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is $157^{\circ} 30'$ or $10^{\text{h}} 30^{\text{m}}$ west of Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local standard is mentioned.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

WEST INDIAN HURRICANE OF SEPTEMBER 1-12, 1900.

Measured by losses of life and property and the depression of the barometer at Galveston, Tex., the hurricane of September 8, 1900, was the severest storm that ever occurred in the United States. On Galveston Island upward of 6,000 human beings were drowned, or killed by falling buildings or flying debris, and property to the estimated value of \$30,000,000 was destroyed. Enormous losses of life and property were also reported in the inland coast country. The barometer, which reached a verified minimum of 28.48 inches at Galveston, was lower by .10 inch than any reading previously made at a station of the Weather Bureau. The maximum wind velocities registered in this and other great storms are not comparable for the reason that the apparatus employed to record wind force can not, as a rule, withstand velocities which approach 100 miles an hour. At Galveston the greatest recorded wind velocity, for a five-minute period, was 84 miles an hour at 6:15 p. m., and 2 miles were registered at a rate of 100 miles an hour. At that time the anemometer was blown away. It was estimated that a velocity of at least 120 miles an hour was attained between 6:15 and 8 p. m. These velocities, both recorded and estimated, have been exceeded at other stations of the Weather Bureau. Excepting Mount Washington and Pikes Peak, the record for high winds in the United States was established at Cape Lookout, N. C., August

18, 1879, where a velocity of 138 miles an hour was registered before the anemometer was blown away, and the wind reached an estimated velocity of 165 miles an hour. During the tornado of May 27, 1896, at St. Louis, Mo., an extreme velocity of 120 miles an hour was recorded.

The devastation at Galveston was caused principally by a storm wave, which swept in from the Gulf in advance of the hurricane's vortex. This wave, 4 feet in depth, struck the already submerged island with almost irresistible force, and entirely destroyed the south, east, and west portions of the city for a distance of two to five blocks inland. In other parts of the city many houses were destroyed and none escaped injury.

There are a number of instances on record in which storm waves have caused appalling losses of life. In the sixteenth century the Lincolnshire coast of England was swept by a storm wave which caused a loss of thousands of human lives. On October 5, 1864, a storm wave, 16 feet deep, caused the loss of 45,000 lives on the Ganges delta. On October 31, 1876, a storm wave, 10 to 50 feet high, swept the eastern edge of the Ganges delta, destroying over 100,000 lives. Many of the most fatal tidal waves have been accompanied by earthquakes. The Lisbon earthquake of 1755 was accompanied by a wave which destroyed thousands of lives. Islands of the East and West Indies and some of the Japan islands have suffered severely from tidal waves which have attended earthquakes.